UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,946	11/13/2003	Craig Hansen	43876-147	6579

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EXAMINER
COLEMAN, ERIC

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/705,946	HANSEN ET AL.
	Examiner	Art Unit	
	Eric Coleman	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____ .

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van

Hook (Patent No. 6,266,758) in view of Motorola MC68030 users manual (hereafter

referred to as Motorola).

Van Hook taught the invention substantially as claimed including a data

processing ("DP") system comprising(as per claims 1,14):

a) Instruction path (e.g, see fig. 3 and col. 6, lines 25-33)

b) Data path (300,318)(e.g., see fig. 3);

c) External interface (vector load/store unit) (302) operable to receive data from

an external source and communicate the received data over the data path (e.g., see

figs. 3,4);

d) Main memory (e.g., see fig. 3) and Data storage (212) ,RAM (210) (e.g., see

fig. 2);

e) Register file (204, 304) (e.g., see figs. 2,3) ;

f) Execution unit (SIMD vector unit) (e.g., see fig. 3)that performs shift of data of

differing widths (in registers that have a width) in response to shift instructions The

registers have an elemental width smaller that the register width , the number of data

elements in the plurality of data elements is inversely related to the elemental width

(e.g., see figs. 8a, 8b,8c,8d,8e,8f,,8g,8h and col. 9, line 55-col. 11, line 58)

g) Shifting data by a shift amount and providing a concatenated result (e.g., see

figs. 8a, 8b,8c,8d,8e,8f,,8g,8h and col. 9, line 55-col. 11, line 58).

3.   Van Hook did not expressly detail the shifting instruction specified the shifting

amount. Motorola However taught shift instructions that a field that contains a shift

count field and register field indicating register to be shifted(e.g., see page 3-33 in

instruction format and instruction fields portions).

4.   It would have been obvious to one of ordinary skill in the art to combine the

teachings of Van Hook and Motorola. Both references were directed toward the

problems of implementing instructions including instructions that shift data in registers or

memory locations. One of ordinary skill would have been motivated to incorporate the

Motorola teachings of using a shift count field or placing the shift count in a specified

register to allow the combined system to flexible alter the shift amount.

5.   As to the shift amount in the combined system it would have been obvious to one

of ordinary skill considering the shift count and size of the operation as taught by

Motorola and the shifting of elemental portions as taught by Van Hook then in the

combined system the shift amount would have been configurable to amount to

inclusively between zero and one less than the elemental width. Further as to the

limitation that the instructions are decoded this is a conventional feature of standard

processors at the time of the claimed invention to allow the user to use computer

languages that use words and   letters instead just numbers . Since the instructions in

Van Hook and Motorola were ones that used words in the instructions then one of

ordinary skill would have been motivated to decode instructions for use in the Van Hook

and Motorola system.

6.   Van Hook did not expressly detail a cache memory. However since Van Hook

taught a system that retrieved data and instructions from main memory which is

characteristically a slow memory one ordinary skill would have been motivated to

incorporate a cache to store data and instructions ahead of the time needed to provided

quicker access to data and instruction as was well known in the art at the time of the

claimed invention.

7.   As per claim 2, 15, Van Hook taught a concatenated result is provided to a

register (e.g., see figs. 4,8a, 8b, 8c, 8d, 8e, 8f, 8g, 8h and col. 9, line 55-col. 11, line 58).

8.   As per claim 3,16, Motorola taught the shift amount is contained in a register

specified by the instruction (e.g., see page 3-33 in instruction format and instruction

fields portions).

9.   As per claim 4,17, Motorola taught the shift amount is contained in an immediate

field of the instruction (e.g., see page 3-33 in instruction format and instruction fields

portions).

10.   As per claim 5,6,18,19, Motorola taught the data element has a sign bit in a most

significant position and wherein the execution unit is further operable to fill a shift

amount number of most significant bits in each of the second plurality of data elements

with the sign bit from a respective data element in the first plurality of data elements

(e.g., see page 3-32). Van Hook taught filling with the sign bit the space for each data

element shifted data word by the amount shifted (e.g., see fig. 8c,8d). Therefore one of ordinary skill considering the teachings of Motorola and the Van Hook teachings of elemental portions of data within the data word that are shifted would have been motivated to provide the shifting and of the filling of the sign bits for each data element. This filling of the sign bit would have been with a ones or a zeros depending on the sign of the data (e.g, see figs. 8c,8d of Van Hook).

11.   As per claim 7,20 Van taught shifting data in plural data elements from one register and storing the shifted data into an additional register (e.g., see figs. 4,8a, 8b, 8c, 8d, 8e, 8f,8g, 8h and col. 9, line 55-col. 11, line 58). Motorola taught shifting by a shift count and filling the one end of the data element. Therefore one of ordinary skill considering the teachings of Van Hook and Motorola would have been motivated to fill a shift amount number of bits in each of the second plurality of data elements with a subfield from a respective location of an additional register (e.g., see figs. 8c,8d of Van Hook).

12.   As per claims 8,9,10,21,22,23 It was well known in the art that standard processors at the time of the claimed invention standard operated on larger word widths as memories became larger which allow the system to address larger numbers of locations of data in memory and this is increase by a multiple of 2. Also with the motivation of using increased word widths one of ordinary skill would have been able to take advantage of the larger word widths of memory. Therefore one of ordinary skill would have been motivated to use operate on 128 bit width data as the memories that could hold the corresponding number locations were available and/or had larger width

locations. Also, since Van Hook taught 64 bit data and Motorola taught (e.g., see page

3-33 in instruction format and instruction fields portions) byte, Word and long operations

the one of ordinary skill would have motivated provide for the use of 32 bit and 16 bit

data.

13.   As per claim 11,24, Van Hook taught an elemental width of each the second

plurality of data elements being equal to the elemental width of each of the first plurality

of data elements (e.g., see fig. 8a, 8b, 8e, 8f, 8g, 8h).

14.   As per claim 12, 25 Van Hook taught the elemental width of each of the second

plurality of data elements being equal to twice the elemental width of each of the first

plurality of data elements (e.g., see figs. 8c, 8d).

15.   As to the limitation of claim 13, Van Hook and Motorola did not expressly detail

that the elemental width of each of the second plurality of data elements was equal to

half the elemental width of each of the first plurality of data elements. However one of

ordinary skill would have been motivated to send data of one size to an other as data of

half the size at least to compress the data and save memory space. On the other hand

when the precision of the data was double precision and the operation was single

precision operation one of ordinary skill would have been motivated to convert the data

to half the size. Also since van Hook taught expanding from one size to twice the size of

an operand by filling with the sign bit (e.g., see figs 8c, 8d) one of ordinary skill would

have been motivated to convert the data back to half the size of the expanded data.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Song disclosed a scalable width vector processor (e.g. see abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Coleman whose telephone number is (571) 272-4163. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EC

ERIC COLEMAN
PRIMARY EXAMINER